Extensive foot-notes point the reader to further sources of information and a full index adds to the value of the book as a work of reference.

This book can well be declared the most complete and most authentic work extant on this important subject and it should be read by the student of physics to whom a knowledge of units and standards is most necessary, as well as by all who wish to be well informed in regard to this interesting topic.

A thorough test has proved that every recognized authority has been consulted and more than one forgotten pioneer in metrology has been given due credit for his contribution to the science. On the whole the book can be commended without reservation and the authors are entitled to our best thanks for placing in compact readable form facts that are accessible to the few and obtained by them after long and tedious research.

J. H. GORE.

Notes on Electrochemistry. By F. G. WIECH-MANN, Ph.D. 5 x 9 in., pp. vi + 144. Price, $2.00. New York, McGraw Publishing Company. 1906.

The aim of the author, as expressed in the preface, has been to give ' a clear and concise presentation of the general principles which underlie electrochemical science,' ' to offer a general survey of the subject, to serve as an introduction to its study and to aid in the securing of a proper understanding and appreciation of the work along individual lines.'

In pursuing this aim, the author has devoted seven pages to general principles of science, fourteen to general principles of electrical energy, nineteen to electrochemistry proper, fifteen to electrolytic dissociation, seventeen to electrochemical analysis, forty-six to electrotechnology, and ended up with a name and subject index. Each chapter is prefaced by a list of the most important literature on its particular subject.

We differ in opinion from the author concerning the classification of electrotechnical processes; his division into direct-action and indirect-action processes seems to us to be illogically worked out, at least as far as re-

gards placing ' electrodeposition from fused electrolytes ' among the ' indirect action ' processes. On page 125, line 6, the accidental omission of ' not ' makes the sentence express the reverse of the facts concerning the first news of the manufacture of calcium carbide. There are a few other shortcomings really not worthy of mention, in view of the high standard of excellence and accuracy prevalent in the book.

The plan of the work is admirable, it is carried out in a masterly manner, and the author has produced an introduction to electrochemistry which most satisfactorily fulfills his objects, as quoted above. The style is clear and crisp, the information of a high standard of reliability and surprisingly up-to-date. The balance is excellent. For student, technologist, general scientist or man of affairs, it can be highly commended as a trustworthy, satisfactory and inspiring guide into electrochemistry.

JOSEPH W. RICHARDS.

SCIENTIFIC JOURNALS AND ARTICLES.

The Journal of Experimental Zoology, Vol. III., No. 3 (September 1906), contains the following articles: ' Locomotion of Amœbæ and Allied Forms,' by Oris P. Dellinger.

Amœbæ and Difflugias are studied from side view as they creep along the polished edge of a glass slide. From such a view the points of attachment and support which furnish the key to their locomotion are easily seen. All forms studied alternate the points of attachment and pull and squeeze themselves along. ' Light Reactions in Lower Organisms. I. *Stentor Cœruleus,*' by S. O. Mast. ' The Influence of Light and Heat on the Movement of the Melanophore Pigment, especially in Lizards,' by G. H. Parker. A study of the color changes in the skin of the horned toad shows that the so-called reversed color changes of certain lizards, Stellio, Uromastix, etc., are probably temperature reactions and not light reactions, and leads to the conclusion that in all melanophores and other like pigment cells, whether they are in the skin or the eyes of the vertebrates or

invertebrates, the general rule seems to hold that light and low temperature induce a distal migration, and the absence of light and high temperature a proximal migration of the contained pigments. 'Some Reactions of Caterpillars and Moths,' by Alfred G. Mayer and Caroline G. Soule. Larvæ of *Danais plexippus* are negatively geotropic, and also positively heliotropic to ultra-violet rays. These reactions serve to maintain them high up upon their food plant, and to prevent their wandering away. Caterpillars have no associative memory lasting more than one and a half minute, and they do not learn a labyrinth. Normal gipsy moth females select against males if the latter be deprived of wings, but if the females be deprived of sight they do not select against such males. In moths there is no sexual selection in respect to color. 'Modifiability in Behavior. II. Factors Determining Direction and Character of Movement in the Earthworm,' by H. S. Jennings. This is an analytical study of the various factors, internal and external, which decide how the earthworm shall move at a given moment. The matter is found to be extremely complicated.

SOCIETIES AND ACADEMIES.

THE AMERICAN MATHEMATICAL SOCIETY.

THE one hundred and thirtieth regular meeting of the American Mathematical Society was held in New York City, on Saturday, October 27, 1906, thirty-three members being in attendance. President W. F. Osgood presided at the morning session, Ex-President T. S. Fiske at the afternoon session. The council announced the election of the following persons to membership in the society: Professor A. F. Carpenter, Hastings College; Dr. H. M. Dadourian, Yale University; Mr. T. E. Gravatt, Pennsylvania State College; Rev. A. S. Hawkesworth, Allegheny, Pa.; Mr. H. R. Higley, Pennsylvania State College; Dr. Mario Kiseljak, Fiume, Hungary; Dr. Emanuel Lasker, New York, N. Y.; Professor Ernst Lebon, Lycée Charlemagne, Paris; Dr. R. L. Moore, Princeton University; Mr. W. P. Russell, Pomona College; Professor J. H. Scarborough, State Normal School, Warrensburg,

Mo.; Mr. L. P. Siceloff, Columbia University; Professor Cyparissos Stephanos, University of Athens. One application for membership was received. The total membership of the society is now five hundred and fifty-eight.

A list of nominations of officers and other members of the council was adopted and ordered placed on the official ballot for the annual election at the December meeting. A committee was appointed to audit the treasurer's accounts for the current year.

Professor W. F. Osgood tendered his resignation from the editorial committee of the *Transactions,* finding it impossible to assume the burdens of the office. The vacancy was filled by the appointment of Professor H. S. White.

The following papers were read at the meeting:

S. F. RICHARDSON: 'Note on poristic systems of polygons.'

R. D. CARMICHAEL: 'Multiply perfect numbers of four different primes.'

ARTHUR RANUM: 'On Jordan's linear congruence groups.'

BEPPO LEVI: 'Geometrie projettive di congruenza e geometrie projettive finite.'

CHARLOTTE A. SCOTT: 'Note on regular polygons.'

MAX MASON and G. A. BLISS: 'Some problems in the calculus of variations in space with variable end points.'

EDWARD KASNER: 'Note on the transformations of dynamics.'

G. A. MILLER: 'Groups of order p_m containing exactly $p + 1$ abelian subgroups of order p^{m-1}.

G. A. MILLER: 'The groups in which every subgroup is either abelian or hamiltonian.'

The San Francisco section of the society met at the University of California, on Saturday, September 29, 1906.

The next meeting of the society will be the annual meeting for the election of officers on Friday and Saturday, December 28–29, 1906. The Chicago section will also meet during the Christmas holidays. W. H. BUSSEY,
Assistant Secretary.

THE AMERICAN PHILOSOPHICAL SOCIETY.

A STATED meeting was held on November 16, 1906, at 8 o'clock. Professor Harry F.